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PALEONTOLOGY.—*A new species of Carinocrinus from Oklahoma.* HARRELL L. STRIMPLE, Bartlesville, Okla. (Communicated by Alfred R. Loeblich, Jr.)

I collected the specimens used in this study from the upper Pitkin formation (Chester) in the Cookson Hills, southeast of Muskogee, Okla. I consider the species to be referable to the genus *Carinocrinus* Laudon, though the arm structure is different from that of *C. stevensi* Laudon, which is the genotype species and only form heretofore known. According to the description and illustration of *C. stevensi*, the first bifurcation does not take place before the fifth primibrachials (PBrBr₅), whereas in *C. eventus*, n. sp., the first primibrachials are known to be axillary in at least four of the arms (the anterior ray has two known rami, but the point of branching is questionable). The arms of *C. eventus* are somewhat stouter than those of *C. stevensi* and the dorsal cup of the former species has a relatively greater length due mainly to the unusual length of the basal plates.

Laudon considered *Carinocrinus* to have probably evolved through *Culmicrinus* and was no doubt influenced by the arm structure of *C. stevensi*. The arms of *Culmicrinus* do not commence their isotomous branching until several PBrBr are formed. As noted above, this is not the case in *C. eventus*. I am inclined to consider *Gilmocrinus* Laudon as a possible ancestral form based on the steeply conical dorsal cup and relatively stout anal sac. *Gilmocrinus* has only five arms; however, strong ramules are present and it is not unreasonable to suppose they could have evolved to regular arms.

Carinocrinus eventus, n. sp.

The dorsal cup is elongate, conical shaped, with infrabasals (IBB) readily visible in side view of the cup. The five IBB rise evenly from the round columnar attachment. Five basals (BB)

are considerably longer than wide. Five radials (RR) are pentagonal, slightly wider than long. Three anal plates occupy the posterior interradius. Anal X is in full contact with post. B and extends above well into the interbrachial area. RA is almost vertical in attitude, and contacts r. post. B and post. B below, r. post. R to the right, anal X to the left, and the large RX above.

It is possible to establish at least portions of the arm structure for all five rays by observing the three type specimens. PBrBr do not fill the distal face of RR, and all observed are axillary. The anterior ray is known to have at least two arms but the PBr is missing. A second isotomous branching usually occurs with the seventh to ninth SBrBr. Thereafter, isotomous branching has been observed in most rays with the sixth to seventeenth TBr. In the right posterior ray, another division is found with the seventh QBr. The arms are becoming rather thin as preserved and most likely do not reach the termination of the massive, club shaped anal tube. Nonaxillary brachials are wedge shaped and apparently pinnular. The arms have a well-rounded exterior.

Near its base, and for a considerable portion of its length, the anal sac is composed of circlets of six plates. Along the lateral sides of each tube plate, a pore slit, or pit, is shared with the plate below and another with the adjoining plate to the right or left, as the case may be. The same is true at the upper corners. In addition, there is a pit at midlength of each lateral side which is shared by the apposing plate. This leaves a divergent ridgelike development which passes from one row of plates to the other rows. The slits first appear in the upper portions of anal X and RX, where they are more numerous than outlined above. They are present to a lesser degree in the uppermost portion of the sac; however, in that area there are numerous smaller plates interposed amongst the original circlet of

six. Some tendency toward small spine like protrusions has been observed on the terminating plates of the sac, but they are relatively inconspicuous. It appears that the anal tube rises and then reverses directions so that the anal opening is very likely low on the sac. Such development was found in *C. stevensi*.

Remarks.—The outstanding differences between *C. eventus* and *C. stevensi* have been given in the preface to this description. It might be added that *C. eventus* is a more robust form but has a slightly shorter anal sac than found in *C. stevensi*.

Measurements in mm.—As follows:

	<i>C. eventus</i> (holotype)	<i>C. stevensi</i> (after Laudon)
Width of dorsal cup....	32.2 ¹	19
Height of dorsal cup....	37.0	22
Width of IBB....	8.2	4
Height of IBB....	12.0	5
Width of BB....	10.3 ²	8
Height of BB....	21.1 ²	9
Width of RR....	12.6 ³	10
Height of RR....	8.8 ³	6
Anal sac, length.....	94.5	113
Anal sac, width at midlength....	21.6	14
Anal sac, width at expanded distal portion.....	28.5	19

¹ Mildly distorted by compression.

² Left posterior basal.

³ Left posterior radial.



FIGS. 1, 2.—*Carinocrinus eventus*, n. sp.: 1, Holotype from posterior, $\times 1$; 2, paratype from right posterior, $\times 2$.

Occurrence.—Shale break in the upper Pitkin formation, Chester, Mississippian; exposure in the bluffs overlooking the Arkansas River about 1½ miles southwest of Cedar Creek Community, which is south of Oklahoma State Highway 10, between Greenleaf Lake and Gore, Okla. The exposure is the same as the type locality of such forms as *Paianocrinus durus* Strimple, *Bronaughocrinus figuratus* Strimple, *Telikosocrinus caespes* Strimple, and others.

Types.—Holotype and two paratypes are to be deposited in the U. S. National Museum.

REFERENCES

- LAUDON, LOWELL R. Journ. Pal. **15**: 390, pl. 57, fig. 5. 1941.
 STRIMPLE, HARRELL L. Journ. Washington Acad. Sci. **41**: 260–263, figs. 1–13. 1951.
 ———. Journ. Pal. **25**: 669–676, pls. 98, 99. 1951.

BOTANY.—*Studies of South American plants, XIII*. A. C. SMITH, U. S. National Museum.

Continuing his study¹ of special families of phanerogams in South America, the writer here describes 11 new species in the families Myristicaceae, Monimiaceae, and Vacciniaceae, discussing various other noteworthy plants in these families and in the Hippocrateaceae and Ericaceae as well. The specimens upon which these notes are based were obtained in recent years by several collectors in the Andean countries from Colombia to Bolivia; most of them are deposited in the U. S. National Herbarium. Mention should also be made of a very valuable series of specimens collected in Colombia and Peru by Christopher Sandeman, kindly forwarded for study by the Director of the Royal Botanic Gardens at Kew. The place of deposit of the specimens here cited is indicated as follows: BM (British Museum [Natural History], London); Ch (Chicago Natural History Museum); Col (Instituto de Ciencias Naturales, Bogotá); K (Royal Botanic Gardens, Kew); NY (New York Botanical Garden); and US (U. S. National Museum).

MYRISTICACEAE

Viola obovata Ducke in Bol. Técn. Inst. Agron. Norte (Belém) **4**: 12. 1945.

COLOMBIA: Amazonas: Picada Cotuhé, *Schultes & Black* 46-359 (US) (open "varial," stream-margin; tree 6 m high; fruit chestnut-colored).

This appears to be the second recorded collection of the species, of which the type comes from the mouth of the Javary in adjacent Brazil. As compared with a duplicate of the type (*Ducke* 1509), our specimen has the leaf-blades

narrowly elliptic rather than slightly obovate, and the indument of the lower surface evanescent; the fruit is less developed than that of the type. As mentioned by Ducke, the long hairs with conspicuous lateral spurs, which are persistent on inflorescences and to a certain extent on the branchlets and petioles, characterize the species. It is further distinguished from its apparent allies, *V. calophylla* Warb. and *V. calophylloidea* Markgraf, by its acute leaf-blades. Staminate flowers are still desired accurately to ally the species, but this would seem its probable relationship.

Viola micrantha, sp. nov.

Arbor ad 20 m alta, ramulis juvenilibus gracilibus angulatis leviter flexuosis et partibus novellis copiose stellato-pilosis (pilis sessilibus ad 0.1 mm diametro, radiis 5–8), ramulis mox glabratis teretibus cinerascentibus; foliis pro genere parvis, petiolis leviter canaliculatis gracilibus 3–7 mm longis ut ramulis pilosis, laminis papyraceis vel tenuiter coriaceis in sicco fuscis, elliptico-oblongis, 4.5–7.5 cm longis, 1.8–3.2 cm latis, basi et apice obtusis (vel apice obscure mucronulatis), subtus pilis stellatis sessilibus circiter 0.1 mm diametro plerumque 4–6-radiatis inconspicue ornatis, costa supra leviter impressa subtus prominente, nervis secundariis plerumque utrinsecus 12–15 patentibus supra paullo impressis subtus subplanis, venulis utrinque saepe minute impressis; inflorescentiis ♂ paniculatis multifloris 4–6 cm longis latisque, pedunculo 1.5–2.5 cm longo et ramulis ut partibus vegetativis novellis stellato-pilosis; bracteis sub florum fasciculis submembranaceis deltoideo-orbicularibus circiter 2 mm diametro stellato-pilosis mox glabratis et caducis; floribus sessilibus in fasciculis ultimis 1.5–2.5 mm diametro 6–10 aggregatis;

¹ No. XII of this series was published in Contr. U. S. Nat. Herb. **29**: 317–393. 1950.